



UNIVERSITY *of*  
RWANDA

PRACTICE AND BARRIERS OF BREAST MILK EXPRESSION AMONG  
HEALTH CARE MOTHERS OF INFANTS LESS THAN 6 MONTHS AT  
CHUK, RWANDA.

A QUALITATIVE STUDY

Dr. Marie Claire UWAMARIYA, MD

Registration Number 10107689

College of Medicine and Health Sciences

School of Medicine and Pharmacy

Master of Medicine in General Pediatrics

October 2021



PRACTICE AND BARRIERS OF BREAST MILK EXPRESSION AND STORAGE AMONG HEALTH CARE MOTHERS OF INFANTS LESS THAN 6 MONTHS AT CHUK, RWANDA:

A QUALITATIVE STUDY

By:

Dr Marie Claire UWAMARIYA, MD

Registration number: 10107689

A dissertation submitted in partial fulfillment of the requirements for the Degree of

MASTER OF MEDICINE IN GENERAL PAEDIATRICS

College of Medicine and Health Sciences/University of Rwanda.

SUPERVISOR

Dr AGABA Faustine, MD, MMed, Neonatologist

Co-SUPERVISORS

Dr. KANYAMUHUNGA Aimable, MD, MMed, Pediatric Hemato-Oncologist

Dr RUTAGARAMA Florent, MD, MMed, Pediatric Endocrinologist

Dr NSANZABERA Maurice, MD, MMed, Pediatrician

October 2021

## CERTIFICATION FOR EXAMINATION

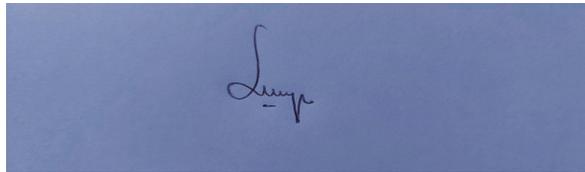
The undersigned certify that they have read and hereby recommend for acceptance by the University of Rwanda a dissertation entitled “Practice and barriers of breast milk expression among health care mothers of infants less than 6 months at CHUK, Rwanda” in partial fulfillment of the requirements for the degree of Master of Medicine (Pediatrics) of the University of Rwanda.

Dr. AGABA Faustine

(Main Supervisor)

Date: 23/12/2021

Signature:



Dr Aimable KANYAMUHUNGA

Co-supervisor

Date: 28/12/2021

Signature:

## DECLARATION

I declare that this dissertation is the result of my work and has not been submitted for any other degree at the University of Rwanda or any other institution.

A handwritten signature in blue ink, appearing to read 'Marie Claire' with a large, stylized initial 'M'.

UWAMARIYA Marie Claire

Registration Number 10107689

## DEDICATION

To The Almighty God

To my parents BIMENYIMANA Alphonse and NYIRAKAMANA Marie Rose

To the beloved sons ISIMWE HIRWA Gael Marcus and ISHIMWE HIMBARWA Anael Marius

To my brothers and sisters

I dedicate this work.

## ACKNOWLEDGEMENT

I express my sincere gratitude to the government of Rwanda through the ministry of health and the University of Rwanda for organizing and supporting the residency program.

My acknowledgments go to my supervisors, Dr. AGABA Faustine, Dr. KANYAMUHUNGA Aimable, Dr. RUTAGARAMA Florent, and Dr. Maurice NSANZABERA for their guidance and support to accomplish this work.

My gratitude also goes to the CHUK administration for allowing me to have access to participants and many thanks to mothers for accepting to participate in this study.

My acknowledgments to Dr AHISHAKIYE MABURO Richard for his support during this work.

I recognize all kinds of support and advice from my family and relatives.

I acknowledge the role of the Pediatric team from all rotation sites for their continuous support.

Finally, I would like to express my gratitude to all Pediatric residents for their continuous support.

May God bless you.

## ABBREVIATIONS AND ACRONYMS

CHUK: Centre Hospitalier Universitaire de Kigali

DOB: Date of Birth

HIC: High-Income country

IRB: Institutional Review Board

LIC: Low Income Country

MIC: Middle Income Country

MOH: Ministry of Health

P: Parity

PI: Primary investigator

RMH: Rwanda Military Hospital

RNIS: Rwanda National Institute of Statistics

UPI: Unique Participant Identifier

UK: United Kingdom

UNICEF: United Nations Children's Fund

UR: University of Rwanda

WHO: World Health Organization

## ABSTRACT

**Background:** Exclusive breastfeeding is recommended in the first six months of life. Breast milk expression is important in promoting breastfeeding among working mothers and it is an alternative strategy for working mothers to exclusively feed their infants with breast milk, whenever direct breastfeeding is not possible.

**Objectives:** This study was conducted to assess the practice of breast milk expression and storage, among healthcare breastfeeding mothers of infants of less than 6 months of age, in Rwanda, as an alternative method to keep their babies on breast milk.

**Methods:** This was a qualitative study using thematic analysis. Semi-structured interviews were conducted with thirteen health care breastfeeding mothers of infants with the age less than six months of age, working in one tertiary level hospital, in Rwanda.

**Results:** Thirteen mothers were interviewed from one health facility. All the thirteen mothers were health care providers, three of them were working in the pediatric department and ten out of thirteen mothers were working in the maternity department. Four themes were identified: experience about breast milk expression, feasibility and timing of breast milk expression, storage of expressed breast milk, and challenges while expressing breast milk. All the participants had some information about breastmilk expression. The majority of participating mothers had a positive attitude toward breastmilk expression and storage. The overall practice of breast milk expression in health care breastfeeding mothers was not satisfying with the preference of expressing while at home. The reported challenges included insufficient time for expressing, workload, and insufficient facilities at the workplace.

**Conclusion:** This study showed knowledge gaps in the storage of expressed breast milk. Interventions and supports are recommended to improve breast milk expression and storage at workplace.

**Keywords:** Breast milk expression, challenges, practice, health care, working Mothers.

## TABLE OF CONTENT

DECLARATION.....	iii
DEDICATION.....	v
ACKNOWLEDGEMENT.....	vi
ABBREVIATIONS AND ACCRONYMS.....	vii
ABSTRACT.....	viii
LISTE OF TABLES.....	xii
CHAPTER I. INTRODUCTION.....	1
1.1 BACKGROUND.....	1
1.2 PROBLEME STATEMENT.....	3
1.3 RESEARCH AIMS AND OBJECTIVES.....	3
1.3.1 Research aims.....	3
1.3.2 Research objectives.....	3
CHAPTER II. LITERATURE REVIEW.....	5
2.1 LITERATURE SEARCH.....	5
2.1.1. Breastfeeding status.....	5
2.1.2. Breastmilk expression.....	6
2.1.3. Breast milk Expression Awareness and Practice.....	7
2.1.4. Breastmilk Expression Challenges and Barriers.....	8
CHAPTER III. METHODOLOGY.....	10
3.1. STUDY DESCRIPTION.....	10
3. 2. STUDY DESIGN.....	10
3. 3. STUDY SITE.....	10
3.4. STUDY POPULATION.....	10
3.3.1. Inclusion criteria.....	10
3.4.2. Exclusion criteria.....	10
3.5. SAMPLE SIZE CALCULATION.....	10
3.6. PROCEDURE AT ENROLEMENT AND DATA COLLECTION.....	11
3.7. DATA MANAGEMENT AND DATA ANALYSIS.....	11

3.8. ETHICAL CONSIDERATIONS.....	13
3.8.1. Funding and sponsors.....	13
3.8.2. Potential conflict of interest.....	13
3.8.3. Confidentiality.....	13
3.8.4. Informed consent.....	13
3.8.5. Incentive for the participants.....	13
3.8.6. Risk to the participants.....	13
3.8.7. Ethical approval.....	14
CHAPTER IV: RESULTS.....	15
4.1. DEMOGRAPHICS.....	15
4.2. PRACTICE OF BREAST MILK EXPRESSION.....	18
4.2.1 Experience of breast milk expression.....	18
4.2.2. Feasibility and timing of breast milk expression.....	21
4.2.3. Storage of breast milk.....	22
4.3. CHALLENGES AND BARRIERS.....	24
4.3.1. Time.....	24
4.3.2. Decreasing quantity of breast milk.....	24
4.3.3. Workload related disturbances.....	24
4.3.4. Pain.....	25
4.3.5. Facilities and logistics.....	25
CHAPTER V: DISCUSSION.....	27
5.1. EXPERIENCE OF BREAST MILK EXPRESSION.....	28
5.1.1. Awareness about breast milk expression.....	28
5.1.2. Attitude about breastmilk expression.....	30
5.1.3. Attitude about Rwandan culture and breast milk expression.....	31
5.1.4. Practice of breastmilk expression.....	31
5.2. FEASIBILITY AND TIMING OF BREASTMILK EXPRESSION.....	32
5.2.1. Time of breast milk expression.....	32
5.3. STORAGE OF EXPRESSED BREAST MILK.....	32
5.3.1 Storage method.....	32
5.3.2. Storage time.....	33
5.4. BARRIERS AND CHALLENGES ENCOUNTERED WHILE EXPRESSING.....	33
5.4.1. Time.....	33
5.4.2. Stress and decrease in quantity of breast milk.....	33

5.4.3. Workload associated disturbances.....	34
5.4.4. Pain.....	34
5.4.5. Facilities and logistics.....	34
5.5. LIMITATION OF THE STUDY.....	35
CHAPTER VI: CONCLUSION AND RECOMMENDATIONS.....	36
REFERENCES.....	38
APPENDIX 1 : BASELINE DEMOGRAPHICS FORM.....	41
APPENDIX 2 : SEMI-STRUCTURED INTERVIEW SCRIPT / QUESTIONNAIRE.....	42
APPENDIX 1: CONSENT FORM.....	44
APPENDIX 4: IRB APPROVAL.....	50
APPENDIX 5: CHUK ETHIC COMMITTEE APPROVAL.....	52

LISTE OF TABLES

Table 1 Demographic information.....16

Table 2 Table of themes.....17

## CHAPTER I. INTRODUCTION

### 1.1 BACKGROUND

Breast milk is the best first food for human infants (1), and breastfeeding successfully is the crucial step for good nutrition. Breast milk is the best to the human infant for for nutritional, emotional, immunological and cognitive benefits (2).

According to the WHO, breastfeeding has many effects to the mothers and to the infants. It is estimated that infants that have been exclusively breastfed have at more than 2.5 times fewer infectious illness and those who were not are 3 times more likely to die of respiratory infection and has 5 times chance to die from diarrhea in the first 6 months of their life compared with those who have been exclusively breastfed (3).

Currently, many reasons can cause physical separation from the mother to the infant, which may be short or long term, among them we can cite mother returning to work or school or any other social engagement (4).

Returning to work is a significant barrier to exclusive breastfeeding and often working breastfeeding mothers face inflexibility in the working hours, limitations due to transport issues and a lack of privacy for breastfeeding or expressing milk, lack of appropriate place for storage of expressed breast milk, makes them difficult to fulfill their tasks of breastfeeding mothers, especially for infants less than 6 months who are not yet allowed to take supplementation (5).

WHO recommends twenty four weeks of maternity leave(6), for protection of maternal and child health after birth to promote exclusive breastfeeding in working mothers, which is still a big challenge in many countries especially in developing countries

Regarding the maternal leave in Rwanda, in the official gazette, Law N° 13/2009 Of 27 May 2009 Regulating Labour in Rwanda, establishing the general statute governing public servants, section 3 maternity leave, article 64, a female public servant who gives birth has the right of maternity leave of 12 consecutive weeks including two that can be taken before delivery.

The WHO and UNICEF in 1989 established policies for improving the rates of breastfeeding by protecting, promoting then supporting breastfeeding, with three strategies(7,8).

- Protection; a set of policies made in place to protect feeding infants with the commercial sector products
- Promoting: give accurate and non biased information about infant feeding
- Support: avail support to women from birth, at home, in the community, and at workplace (including the breastfeeding room in every workplace to help to breastfeed mothers in breast milk expression with privacy and to facilitate the storage of the expressed breast milk.)

Health care providers have an important impact on the intention of breastfeeding, from its initiation, and the duration of breastfeeding. Many health workers have insufficiency knowledge and skills to help and support women regarding breastfeeding and to support exclusive breastfeeding(7,9).

Many studies have been showing that women who received encouragement from health care providers regarding breastfeeding are more likely to early initiation and maintain breastfeeding than women who did not(9).

## 1.2 PROBLEME STATEMENT

Studies revealed gaps regarding knowledge gaps in the expression and storage of breast milk that needs to be addressed especially in developing countries to enable exclusive breastfeeding in both non-working and working mothers of children less than 6 months of age.

In Rwanda, we do not have much information about breast milk expression and its storage among working mothers and more than that about barriers in breast milk expression and storage.

This study was assessing the practice of breast milk expression, storage of expressed breast milk, and barriers encountered by health workers breastfeeding mothers of infants less than 6 months.

## 1.3 RESEARCH AIMS AND OBJECTIVES

### 1.3.1 Research aims

This study aimed

- To determine the practice of breast milk expression and storage of expressed breastmilk among healthcare breastfeeding mothers of infants less than 6 months
- To assess barriers of breast milk expression; its storage among healthcare breastfeeding mothers of infants less than 6 months of age.

### 1.3.2 Research objectives

- To explore the experience of breast milk expression
- To determine the practice of breast milk expression
- To identify the feasibility and timing of breastmilk expression
- To determine challenges and barriers uncouncted by healthcare breastfeeding mothers during breast milk expression and storage.



## CHAPTER II. LITERATURE REVIEW

### 2.1 LITERATURE SEARCH

Breastfeeding is, according to the WHO, the fundamental right of every child. Feeding practices vary due to different factors, from one country to the other, from families to families, and from a mother to another due to health, personal or social factors (10).

Exclusive breastfeeding is defined as a practice of feeding infants with human milk with no other nutrient liquids, or food in the first six months of life, except for vitamins, mineral supplements, or medications prescribed by a health professional(3,11). Exclusive breast feeding has many benefits including lowering the risk of gastrointestinal infection, respiratory infections, in the infant (3,12).

#### 2.1.1. Breastfeeding status

UNICEF and WHO recommend early breastfeeding in the first hour of life, from the report published in 2016 by the UNICEF, about breastfeeding from the first hour of life up to 2 years of age, about a half of all newborns are breastfed within one hour after birth (13,14).

Worldwide, most babies have been breastfeeding at some point in their lives, with 95 percent of babies ever receiving breast milk. But there is a big variation between LIC/MIC and HIC were in low- and middle-income countries, 4 %, or 1 in 25 babies, are never breastfed and 21%, or more than 1 in 5, never receive breast milk in high-income countries (10).

Compared to the world average in 2015 of 44% for early breastfeeding, the highest rate is found in Brazil with 68% and in the UK with 75% of early initiation of breastfeeding while the Philippines and Bangladesh have 54% and 47% rates above the world average and the lowest rates in Indonesia with 29% and Nigeria 23%(7).

From birth to six months it is recommended to feed the infants only breast milk which is the safest and healthiest option for every child(1,3,6,13).

Globally, from the UNICEF report in 2016, 40 % or two over five of the world's infants under 6 months of age are exclusively breastfed (13), while the estimated world average for exclusive breastfeeding in 2015 was 38%, and Bangladesh has demonstrated a rate of exclusive breastfeeding at 64% was ranked in the top ten countries for exclusive breastfeeding (7)

In Rwanda, a recent study done in 2019, Rutagumba et al, in a study done on predictors of Exclusive Breastfeeding Practice in Urban Kigali, the prevalence of exclusive breastfeeding was 55.7% and was progressively decreasing from birth, where it is 85.1% at 1 month of age, 81.9% at 3 months of age and 57.5% at 5 months(15).

In almost all regions, the rates of continuing breastfeeding from 6 months to age 2 and beyond are highest among women from the poorest areas. worldwide, less than 50% of all children are still breastfed at 2 years. The rate of continuation of breastfeeding drop from 74 % at 1 year to 46 % at 2years(13).

Women who are working are the most who are not breastfeeding or early weaning. Minimizing barriers to breastfeeding for working mothers by providing lactation rooms and nursing breaks is one of the low-cost intervention that may prevent early cessation of breastfeeding and improve working breastfeeding mother's performance(16).

### 2.1.2. Breastmilk expression

The American Academy of Pediatrics recommends exclusive breastfeeding in the first six months and the continuation of breastfeeding within the first year of life(1).

To achieve this, working mothers have to overcome some challenges including separation from their infant while resuming their daily activity after their maternity leave period. Breast milk expression, manually or with a breast pump device, may help mothers to achieve some of the goals of successful exclusive breastfeeding and, increase breastfeeding duration(17,18).

Experts and consultants in lactation found that breast milk expression is an alternative method for exclusive breastfeeding whenever direct breastfeeding is not possible, then it allows mothers to achieve their exclusive breastfeeding goals(11).

For this, breast milk expression is important in promoting breastfeeding among working mothers. Breast milk expression has been frequent due to different reasons nowadays where mothers are returning to work as early as before 6months(11).

In developing countries, including in Rwanda, where the paid maternity leave is below the recommended period by WHO, exclusive breastfeeding is very difficult for many of working mothers(1). Different studies are done to suggest that to facilitate working mothers who is wishing to continue breastfeeding after returning to work can use electric pumps to express the breast milk for the infants(17,19).

Expression of breast milk also promote some emotional connection between infants and their mothers who are not together due to various reasons and mothers who are expressing their breast milk, it has been shown that they continue breastfeeding for at least six months than those who are not expressing(1,18), breast milk expression build bonding between the mothers and their infants(1).

There are different techniques of breast milk expression; manual expression or breast pumpsexpression(8). Although feeding expressed milk reduces some advantages of breastfeeding, exclusive human milk feeding is preferable compared with infant formula(11,18).

### 2.1.3. Breast milk Expression Awareness and Practice

Worldwide, studies have shown a high level of breast milk expression especially in the developed country however there are still gaps in developing countries regarding awareness and practice of breast milk expression(18).

Pandey et al, in a study done in Nepal in 2018 showed that almost a half of the participants 48.8 % had acceptable knowledge about expressed breastfeeding and above the half of the mothers 52.2% had a negative attitude towards expressed breast milk feeding, while 11.7% of mothers were expressing or expressed breast milk at a certain point after the delivery of their babies(17).

One study published in 2017, done in India about knowledge, attitude, and practice of expressed breast milk feeding among working mothers and barriers of breast milk expression showed that 60% of working mothers had a positive attitude regarding breast milk expression while 40 % had

a negative attitude. In the same study, breast milk expression was practiced in 11% of 100 working mothers who were enrolled in the study(20).

Prabhu et al, in their study done in Western Maharashtra, 2014 on Knowledge, Attitude, and Practice of Expression of Breast Milk among 95 Mothers showed 93.7% of awareness on breast milk expression awareness of the practice and only 17.9% of them were aware about the availability of pumps for the expression of breast milk.45.2% of them knew how to express breast milk by hands, in this same study the prevalence of breast milk expression was 17.9%(21).

In Kenya, in public wellbeing clinics, Edembe et al in 2017 did a study about Knowledge Attitudes and Practice of Breast Milk Expression and Storage Among Working Mothers with Infants Under 6 Months of Age where the correct knowledge about expression of breast milk was 97 %, there was a gap regarding the safest storage duration of breast milk in a refrigerator. The prevalence of breast milk expression were 41%. The knowledge on breast milk expression was 43% while satisfactory knowledge on storage was 47%. Only 34% of mothers had satisfactory knowledge on both breast milk expression and storage(19).

In Uganda, Okonya et al, in 2017 did a study in 217 working breastfeeding mothers attending the postnatal clinic at Mulago Hospital, Uganda, about Perceptions of breast milk expression practices among working mothers where the knowledge regarding breast milk expression was 79.3%, and the breast milk practice was 73.7%. about the storage, only 7.4% were aware that storage of breast milk at room temperature for 4 hours is possible and 2.3% were aware that storage of expressed breast milk in the refrigerator can be done up to 2 days(22).

Of all the studies done about knowledge and practice of breast milk expression and storage in breastfeeding working mothers showed a high level of knowledge in different countries, however, the practice of breast milk expression is still minimal. Studies are needed to know more about challenges and barriers accounted by working mothers that prevent them to practice breast milk expression while they have sufficient knowledge.

#### 2.1.4. Breastmilk Expression Challenges and Barriers

Challenges and barriers are different from one country to one another, from one society to another due to social, economic, and sometimes religion. In one study done in a rural area, Kenya, Africa, about Knowledge and attitudes of feeding expressed breast milk to infants in rural

Coastal Kenya, some of the mothers compared the practice of expressing milk to milking a cow and they report that they did not wish to try(23).

Referring to the study done in Nepal, Pandey et al, 2018, reasons for not expressing, inadequate breast milk production was cited in 30.7% as a reason for not expressing breast milk, other reasons given by the mothers included lack of time in 26.4%, feeling that the taste of expressed breast milk was not good in 16.5% of mothers, insufficient knowledge regarding breastmilk expression technique in 16%, logistic issues like no privacy at workplace, no available or expensive breast pumps in 16% and belief that expressing is unhealthy to infants in 16%.(17).

In a study done in India about knowledge, attitude, and practice regarding expressed breast milk feeding among working postnatal mothers, reasons identified include lack of knowledge in 22%, while 19% were not comfortable about storage of breast milk(21).

In Uganda, reasons are different, in a study done on breastfeeding mothers at Mulago Hospital, lack of money to buy equipment was the commonest reason in 24% of mothers. In this same study, participants had negative attitude about breast milk expression, where more than a half of the participants felt that breast milk expression is taboo, and about a half of participants agreed that it was shimmering to express breast milk(22).

## CHAPTER III. METHODOLOGY

### 3.1. STUDY DESCRIPTION

To facilitate a rich description of breast milk expression practice in health care breastfeeding mothers than the challenges and barriers of breast milk expression and its storage, we adopted a qualitative approach using content analysis, and data were collected using semi-structured interviews.

### 3.2. STUDY DESIGN

Qualitative study using semi-structured interviews

### 3.3. STUDY SITE

This study has been conducted in July 2021, at CHUK, in Kigali, Rwanda.

CHUK is the referral hospital located in Kigali City, Rwanda, with a population of 1.2 million inhabitants. The University Teaching Hospital of Kigali is the largest public and tertiary referral hospital in Rwanda and serves as a teaching hospital for the University of Rwanda.

### 3.4. STUDY POPULATION

Participants were breastfeeding healthcare mothers of infants less than 6 months working at CHUK who resumed their activity in the hospital after their maternal leave ends.

#### 3.3.1. Inclusion criteria

We included breastfeeding healthcare mothers of infants less than 6 months working at CHUK, Rwanda, under the period of the study working in different departments.

#### 3.4.2. Exclusion criteria

We excluded mothers who have contraindications of breastfeeding and those who did not consent for participation in the study.

### 3.5. SAMPLE SIZE CALCULATION

The aim of qualitative research is purposive sampling, selecting participants who are likely to generate appropriate and useful data and including enough of them to answer the research question.

Participants have been recruited until saturation is reached. According to Guest et al (2006), saturation is defined not in terms of theoretical development, but simply when information from analysis produced “little or no change to the codebook”. Once saturation is reached two further interviews will be undertaken for assurance of saturation 12-15 subjects are suggested as adequate to achieve saturation in qualitative research such as this(24). The aim was to get a meaningful understanding of the main themes, rather than rich theory being developed(25).

The intention was to keep sampling and analyzing data until no new information is being generated (saturation). To identify this, each interview will be transcribed, translated, and coded before proceeding with the next interview. This was to ensure that subjects are recruited with saturation tacking.

### 3.6. PROCEDURE AT ENROLMENT AND DATA COLLECTION

Data collection was done using semi-structured interviews, conducted face-to-face with the participants. Interviews were digitally recorded using a smartphone.

The interviews were conducted at CHUK in the department where the participant was working in a quiet, private, room after explanation and obtaining consent for participation.

Participants were enrolled and explained the purpose and methods of the study and get informed consent. After obtaining informed consent, demographics were collected in a paper questionnaire completed by the PI directly from the breastfeeding working mother.

Then after a semi-structured interview was done by the primary investigator in Kinyarwanda.

### 3.7. DATA MANAGEMENT AND DATA ANALYSIS

1. Digital recordings: The digital recordings were kept on the password-protected laptop of the PI. No participant identifiable data was kept in the file name of the recording. A unique participant identifier number was used.

2. Transcriptions and translations also were kept confidential by keeping the responses on a password-secured laptop. No participant identifiable data was kept in the file.

Data analysis was done qualitatively in 6 steps:

Step 1. The first step was familiarization with data by hearing the audio, transcription of the data, and then read the transcript several times to gain a sense of content. Transcription was undertaken by the PI.

Step 2. The second step was a translation of transcripts into English. This was done by the PI, who is competent in writing and speaking English, however, the translation done by the PI was cross-checked by the supervisors before proceeding to the coding step, Interviews were transcribed and translated in Microsoft into Excel. Coding and thematic analysis were performed in Microsoft Excel.

Step 3. The third stage was to identify the thematic framework where the text was divided into meaning units and the condensed units abstracted and labeled with codes.

Step 4. In the fourth stage of indexing, we grouped and analyzed various codes within themes based on differences and similarities and sort them into categories and subcategories by relevance.

Step 5. The fifth stage was charting where we read all collated extracts for each category and decide if they appear to form coherent patterns

Step 6. The sixth stage of mapping is where we defined and refine the categories and analyzed them within themes.

## Coding

A preliminary codebook has been created before starting questionnaires using themes from the literature and the pilot interviews. New codes and themes were added as interviews progressed

## 3.8. ETHICAL CONSIDERATIONS

### 3.8.1. Funding and sponsors

There was no funding

### 3.8.2. Potential conflict of interest

There was a conflict of interest, the principal investigator was a post-graduate in pediatrics and the thesis is part of the university requirements.

### 3.8.3. Confidentiality

The responses were kept confidential by keeping the digital interview responses and transcripts in secured places secured with the password so that only the investigator and supervisors are only ones to have access.

The demographic questionnaire was completed with a Unique Participant Identity to minimize risk to the participants. The identities are not being revealed in any research reports or publications.

### 3.8.4. Informed consent

All participants were informed about the purposes, aims, sources of funding, institutional affiliation of the researcher, the anticipated benefits and potential risks and methods of the study, and guaranteed confidentiality. The PI read for this for them. There was an opportunity for the participants to ask any questions. Participation was voluntary and participants could refuse to participate or withdraw from the study at any time they feel they want.

If the participant accepted to participate in the study, she was asked to sign a written consent.

### 3.8.5. Incentive for the participants

There were no incentives planned

### 3.8.6. Risk to the participants

Physical risk

No physical risks were anticipated as the study is qualitative and will be in form of an interview.

Emotional risk

No emotional risk identified

### Legal risk

No legal risks to participants since the response are confidential and the researcher had approval from different ethics committees.

### Financial risk

No financial risks to researchers and participants since they met at the hospital during the day shift during the break according to the participant working roster.

### 3.8.7. Ethical approval

The study protocol was reviewed, modified, and approved by the University of Rwanda Institutional Review Board (IRB) No 217/ CMHS IRB / 2021 and the ethical committees of CHUK EC/CHUK/076/2021, before starting to approach the participants and proceeding with the research.

## CHAPTER IV: RESULTS

### 4.1. DEMOGRAPHICS

In total 13 mothers were included in the study, 46,1 % were ranging between 36 and 40, 38,4% were between 30 and 35 years, and 15,3% were between 41 and 45 years. All participants were in the procreation period with a mean age of 36.5 years. Among the 13 mothers 77 % were working in the maternity department and 23 % in the Pediatric department. The time of resuming work after the end of the maternal leave was varying from 3 months and 4 months post-partum. For all the 13 mothers, 2 (15.3%) of them were mothers of 1 child, 6 (46.1%) were mothers of 2 children, 1 (7.7%) of them had 3 children, 3 (23%) were mothers of 4 children and 1 (7.7%) was having more than 4 children. All of those 13 mothers have university-level education as they are all working in the tertiary level hospital.

**Table 1. Demographic characteristics**

CHARACTERISTICS		N (%)
AGE	30-35	5 ( 38.4%)
	36-40	6 ( 46,1% )
	41-45	2 ( 15,3 %)
WORKING SERVICE	PED	3 ( 23%)
	GO	10 (77%)
TIME OF RESUMING WORK	2 MO	0
	3 MO	12 (92.3%)
	4 MO	1 ( 7.7%)
LEVEL OF EDUCATION	SECONDARY	0
	UNIVERSITY	13 ( 100%)
NUMBER OF CHILDREN	1	2 ( 15.3%)
	2	6 (46.1%)
	3	1 ( 7.7%)
	4	3 (23%)
	>4	1 (7.7%)

For the thematic analysis, two categories were identified with four themes and thirteen subthemes as showed in the table below

**Table 2. Table of themes**

Categories	Themes	Subthemes	
Practice	Experience	Awareness of breastmilk expression	
		Attitude toward breastmilk expression	
		Attitude toward Rwandan culture and breastmilk expression	
		The practice of breastmilk expression	
		Feasibility and timing	Timing of breast milk expression
		Storage	Storage methods
			Storage time
Barriers and challenges	Barriers and challenges	Workload	
		Time	
		Decrease in quantity of breast milk	
		Pain	
		Stress	
		Facilities and logistics	

## 4.2. PRACTICE OF BREAST MILK EXPRESSION

### 4.2.1 Experience of breast milk expression

#### **Awareness of breastmilk expression**

All the participants had some information about breastmilk expression, from school, what they read from different internet sources, or from what they gained from different attended training.

“what I know is that a mother express to let the baby feed with breast milk when the mother is not around and has to leave the baby to go outside for some reasons” (Participant 7, Q1, L157)

“It is done due to different reasons, when you left the baby, going somewhere like to the market or work” (Participant 2, Q1, L29)

“It is the process that the mother uses to express the breast milk and kept it in a nursing bottle or a cup and it could be used to feed the infant when the mother is not readily present (Participant 9, Q1, L207).

Most breastfeeding health care mothers were aware of breastmilk expression, with some different levels of awareness depending on their experience as mothers and their level of parity.

However, few respondents had no confidence and had some doubts and hesitance about what they knew regarding breastmilk expression.

“I do not have much information; but it helps a mother to get breast milk to feed the infant” (Participant 13, Q1, L303,304).

The level of confidence and awareness is surely different and the difference could be due to the difference in exposure of the participant and her maternal experience.

### **Attitude toward breastmilk expression**

The majority of participants knew that breastmilk expression is a good practice with different advantages to the infant and even to the mother and also to the whole family as they replied while asked about what they think about the practice of breast milk expression.

“it is a good thing, it prevents the baby from feeling hungry, breast milk is crucial for the infant, the infant needs breast milk nutrients, breastmilk expression is economic, this decreases what you spend for the infant need for feeding” (Participant 2, Q1&Q4, L30-35).

“it is a good thing, it allows exclusive breast milk consumption in first 6 months” (Participant 8, Q4, L188)

“It helps the infant to grow well as he receives nutrients from the breastmilk and prevent him to be fed on infant formula milk at a young age and it helps the mother to manage the stress while at work as it prevents painful breast engorgement” (Participant 13, Q1&Q5, L324, 326).

Even though the majority said that breastmilk expression is a good practice, few participating mothers found that breast milk expression is not good and described some disadvantages.

“I think expressed breastmilk loses its nutrients sometime after expressing” (Participant 4, Q5, L85).

“it decreases the maternal-child bond as the baby is fed by another person with expressed breastmilk” (Participant 8, Q4, L192).

The majority of participating breastfeeding mothers had a positive attitude toward breast milk expression. The economic advantages to the family, and nutritional advantages to the infant as was mentioned by the majority of them. Those who had negative perceptions were concerned about the impact of feeding the infant with expressed breast milk on the maternal-child bond and, the possible nutrients loss after expression. This could be explained by the different knowledge of participants about the subject.

### **Attitude toward the Rwandan culture about breast milk expression and storage**

The majority of participants knew nothing about what the Rwandan culture says about breastmilk expression and storage of expressed breastmilk.

However, some of the participating mothers heard from elders that breastmilk expression is taboo, and others heard from elders that it is not a good practice and that was not done before, reported it to be a new thing from civilization.

“I do not know if it is written but I heard that it is taboo” (Participant 1, Q8, L11)

“it is a new thing, it was not known and done before” (Participant 5, Q8, L113)

“in the society, some think that it is not a good thing” (Participant 13, Q7, L308)

The participants work in the rural area and they all have the university level, this can have an impact on what they know and what they believe from the Rwandan culture and breast milk expression and storage of expressed breast milk.

### **The practice of breastmilk expression**

This study showed that the majority of participating mothers have expressed at least once and stopped after a certain time due to different reasons but others were still expressing.

“yes, I do express, I express while at home even at work I do express” (Participant 3, Q10, L64).

“yes, I do express, I do it while at home and work. I try to bring the baby's bottle. We have a room for breastmilk expression at the workplace” (Participant 6, Q10, L142)

“I did it for 1 week, it required to get up early the morning before going at work, I used to express while at home, even at work we have a place to express but for me, the place is not appropriate and it was painful” (Participant 13, Q9&Q11, L311).

Even if the majority were expressing breastmilk, some mothers knew what is breastmilk expression, heard about it, or have seen others doing it, but did never express for their infants as they responded during the interview due to some myths and bad perceptions about the topic.

“I have never express, I heard that it is painful, and also I had not enough milk to make me uncomforted so I didn’t express” (Participant 12, Q21, L281).

“no, I didn’t, I did not express, I had no enough breastmilk” (Participant 8, Q14, L 196)

In general, most breastfeeding health care mothers were expressing breast milk for their infants, however, some had never expressed it despite the awareness of breast milk expression and its advantages due to different perceptions and personal limitations.

#### 4.2.2. Feasibility and timing of breast milk expression

##### **At Home the Morning, at Work in the Break**

The act of breastmilk expression requires enough time and a quiet environment without any kind of disturbance and with good hygiene.

The majority of responders preferred to express while at home, the morning before coming to work, or during break time.

“I used a breast pump, at home the morning, but the breast milk in the baby bottle and left the breastmilk with the caretaker” (Participant 1, Q10, L14).

“I used to express while at home, the morning, kept the expressed breastmilk in the fridge, and I could repeat at noon in the break at home” (Participant 5, Q10, L116).

“I used to express while at home, manually, then I kept the breastmilk, I had no fridge, I tried to express while at work” (Participant 4, Q10, L91).

However, though most of the mothers prefer expressing while at home the morning before coming to work or during the break time, some did it while at work and went home with expressed breastmilk.

“I do it (breast milk expression) while at home and tried it at work as well then I bring the baby's bottle home later. We have a room for breastmilk expression (at the workplace)” (Participant 6, Q10, L142,143).

“I used to express while at home before coming to work manually and even at work, I used to express then keep the expressed breastmilk in the fridge, then I brought the expressed breastmilk at home evening after work” (Participant 7, Q12, L16).

### 4.2.3. Storage of breast milk

#### **Methods of storage of Breast milk**

Almost all participants knew all methods used for breast milk expression though some of them only knew one method, as they responded when asked about the way to handle and store expressed breast milk. The majority of participating mothers used the fridge as the method of expressed breastmilk storage

“expressed breastmilk has to be kept in the fridge for less than 6 hours, I do not know any other method” (Participant 8, Q16, L198).

“I used to express while at home in the morning, kept the expressed breastmilk in the fridge and at noon in the break at home” (Participant 5, Q10, L 116).

“storage is done in the fridge or at room temperature but in the fridge is better” (Participant6, Q10, L146).

Most of the participants stored the expressed breast milk in the fridge and were ever ease to compare to other methods but some are not comfortable about the optimal storage duration and this could be due to different prior knowledge and experience about the subject.

Some others were storing expressed breast milk at room temperature.

“I used a breast pump, at home the morning, but the breast milk in the baby bottle, left the breastmilk with the caretaker” (Participant 1, Q10, L14).

“I used to express while at home manually, then I kept the breastmilk as I had no refrigerator” (Participant 4, Q10, L91).

The participants are comfortable keeping the breastmilk at room temperature and no other methods but it is the most available and cost-effective to them.

## **Storage time**

The majority of participating mothers didn't know about the storage time of expressed breast milk, either when at room temperature, in the refrigerator, or the Freezer, and few of participating mothers had some incomplete information about the storage time of expressed breastmilk with whatever methods of storage used.

“when in the fridge I store it up to 72 hours” (Participant 2, Q11, L43).

“4 hours at room temperature, 3 days when in the fridge” (Participant 7, Q21, L177).

“when there is no fridge, storage at room temperature but to be used not later than 3 hours” (Participant9, Q12, L218).

In general, the methods of expressed breast milk storage were known but the storage time of expressed breast milk was not known by participating breastfeeding mothers.

## 4.3. CHALLENGES AND BARRIERS

### 4.3.1. Time

Most of the respondents find that breast milk expression thought it is time demanding and lack enough time to do breast milk expression.

“lack of time while at work due to workload” (Participant 4, Q20, L100).

“I do not express at work because it is time-consuming” (Participant 8, Q21, L204).

“The challenges are lack of sufficient time, breastmilk expression requires enough time, even at work, time is a challenge because combining work and breastmilk expression is difficult” (Participant 12, Q21, L299)

### 4.3.2. Decreasing quantity of breast milk

The majority of participating mothers find that the stress due to much responsibility and workload causes a decreasing quantity of breast milk over time. While asked about the challenges encountered while expressing, participating mothers responded:

“lack of sufficient breastmilk” (Participant 8, Q21, L203).

“insufficient breastmilk due to no enough time and decrease in breastmilk quantity due to the stress and too many responsibilities” (Participant 1, Q22, L25).

“decrease in breastmilk quantity due to stress which leads to feeding my infant with Infant Formula Milk” (Participant 2, Q19, L47).

In general, physical and psychological stress were reported by most of the participants as one of the challenges and barriers that impacted the progressive production of breast milk, its expression initiation, and continuation.

### 4.3.3. Workload related disturbances

Some of the participating mothers were reporting workload as the main barrier of breast milk expression while at work.

“at work it is difficult, I am even called back to work while expressing in the break time then I had to stop” (participant 7, Q25, L154).

“challenges are found when at work, too much work is impacting the expression of breast milk” (Participant 10, Q22, L251).

The workload was mentioned to be the main challenge while expressing at the workplace, and participating mothers feel not supported by their co-workers or can miss a break and do not have time to express the milk.

#### 4.3.4. Pain

Some mothers reported that expression-related pain was a barrier to them and it could lead to the fear of initiating or continuing the expression of breastmilk.

“I tried once but it was painful and I did not continue” (Participant 13, I21, R22).

“I have never express, I heard that it is painful” (Participant 11, Q20, L276).

Pain is among the complications of breast milk expression and some mothers feel that the pain could be tolerated while for some others it was considered as a barrier for not expressing breast milk for their infants.

#### 4.3.5. Facilities and logistics

Some of the interviewed mothers preferred to express themselves at home as the available area of breastmilk expression at work was not making them comfortable, being a shared or a small room.

“There is no appropriate area available here for breast milk expression, it is the same the area that we are using is for other activities and it is up to us to find by ourselves an area for breastmilk expression” (participant 3, Q23, L77).

“We share the room with mothers whose babies are admitted in neonatology” (Participant 5, Q20, L104).

“even at work we have a place to express but for me, it is not appropriate” (Participant 13, Q9, L313).

Most of the mothers would like to express while at work but sometimes there is no place reserved for breastmilk expression or sometimes the one available was not appropriate or was shared with other activities impacting the privacy, comfort, and concentration



## CHAPTER V: DISCUSSION

Breastmilk expression is one of the strategies to promote exclusive breastfeeding for working mothers who have to leave their infants at home while resuming the daily activities after finishing their maternal leave period estimated at 3 months post-partum in Rwanda.

This qualitative study was conducted to assess the experience and practice of breast milk expression in healthcare breastfeeding mothers of infants of less than 6 months of age as an alternative method to keep their babies on breast milk, while resuming work after finishing their maternal leave, including their experience, feasibility and timing of breastmilk expression, expressed breast milk storage and then to assess the challenges and barriers they encountered while interpreting breastmilk expression.

Our study involved 13 participants, among them 10 (77 %) were working in the maternity department and 3 (23 %) working in the Pediatric department. For all the participants 46,1 % were ranging between 36 and 40 years old, 38,4% were between 30 and 35 years old, and 15,3% were between 41 and 45 years old, with the majority being multiparous (84.7%) and only 2 participants were mothers of 1 child (15.3%). this was different from the Rwandan fertility rate where it is estimated at 4.1 from the currents data of RNIS 2019-2020(26). The time of resuming work after the end of the maternal leave was varying from 12 weeks and 16 weeks post-partum which was different from 24 weeks of maternal leave time advised by the WHO(6). All the participants had a university level of education as they are all working in the tertiary level hospital.

Our findings were grouped into two categories: “practice of breast milk expression” and “barriers and challenges encountered while expressing”.

Four themes were identified:

- “experience about breast milk expression” which described: the awareness about breastmilk expression, the attitude toward breastmilk expression, the attitude toward Rwandan culture and breastmilk expression, and the practice of breastmilk expression,
- “feasibility and timing of breast milk expression” which described the preferable time of expressing.
- “storage of expressed breast milk” which described the storage methods and storage time of expressed breastmilk.
- “challenges while expressing breast milk” described all the mentioned challenges including workload, time, insufficient and decrease of breast milk quantity, pain, stress, facilities, and logistics.

## 5.1. EXPERIENCE OF BREAST MILK EXPRESSION

The overall experience of breastmilk expression was assessed by the attitude toward breastmilk expression, their attitude toward Rwandan culture and breastmilk expression, then their practice of breast milk expression

### 5.1.1. Awareness about breast milk expression

All 13 participants, representing 100%, were having some information about breastmilk expression. All the participants were working in the health sector in a tertiary level hospital, and they all had the university level of education. They all heard about breastmilk expression, from school, what they read from different internet sources, or from what they gained from different attended training

These study findings were supported by studies done by Edemba P. et al in Kenya, Fatimah S. et al in Ethiopia, and Hassan. et al in Bangladesh showed that 97% of the participants had some knowledge about breast milk expression and those with tertiary education and working in the public sector had a significantly satisfactory knowledge and could describe well some importance of exclusive breast milk feeding and expression(19,27,28)

Contrary, Pandey S. et al ( 2020), in the study done in Kathmandu, Nepal found that only half of the participants (50%) had adequate knowledge regarding expressed breastfeeding(17).and the

difference could be due to the background experience and social difference and the fact that our study was limited to qualitative interviews.

### 5.1.2. Attitude about breastmilk expression

Our study findings showed that 11 of participating mothers, representing 84.6% have a positive attitude regarding breast milk expression and could describe the benefits of breast milk expression.

This was shown by how they were reporting the benefits of breast milk expression to the infant, like promoting exclusive breastfeeding, allowing the infant to keep receiving nutrients from the breast milk, preventing the baby from feeling hungry when the mother is at work and could express their will to attempting expression of breastmilk.

They were also reporting the importance of breast milk expression to the mother, as breast milk expression prevent painful breast engorgement while at work, and the importance of breast milk expression to the rest of the whole family, as breast milk expression was reported to be an economical way, to avoid the use of infant formula milk and then decrease in what the family spends.

Our results were similar to those of a study done in India by Rai S. et al (2017), where their result showed that 60% of working mothers had a positive attitude regarding breast milk expression while 40 % had a negative attitude(20). The results are as well similar to those of a qualitative study done in Malaysia by Fatimah S.et al (2020) where they showed that all participating mothers were aware of the expression of breast milk and prepared even for it before finishing the maternal leave(27).

Two participating mothers, representing 15.3% had a negative attitude toward breastmilk expression, with the fact that, for them, expressed breast milk loses its nutrients as time goes, when stored, and also that feeding the infant with expressed breast milk decreases the maternal-infant bond, as the infant is being fed by another person and not feed by her/his mother.

This was supported by Pandey S. et al,(2020), where they found that more than half of the mothers 52.2% had a negative attitude towards expressed breast milk feeding(17).

### 5.1.3. Attitude about Rwandan culture and breast milk expression

This study finding showed that the majority of interviewed healthcare breastfeeding mothers have no information about what Rwandan culture says about breastmilk expression.

However, three participants representing 23 % of the participants reported that they heard from elders that the expression of breast milk and its storage is not good, have been never done in the past, and heard that it is taboo.

Our results were different from the study done in Uganda where Okonya et al (2017) in their research about half of the participants, 50 % felt that it was taboo to express breast milk(22).

This could be due to the difference in the level of education of participants, where all our participants worked in an urban area and where all have a university level of education.

### 5.1.4. Practice of breastmilk expression

Eleven participating mothers representing 84.6 % have been expressing while two participants representing 15.3 % have never expressed.

Those who did express, have been expressing breastmilk or were still expressing. Some of them have been expressing for a short period and stopped due to different reasons. Among the reasons to stop breastmilk expression for a short time, participating mothers reported; a decrease in breast milk quantity, lack of enough time, and pain during breast milk expression.

Two participants who have never expressed breastmilk to feed their infant, their main reasons were inadequate breastmilk production and pain.

Our results were different from the Ugandan results, where Okonya et al (2017), showed that 73.7% of respondents did not practice breast milk expression (22).

However, these results were similar to the results from a study done in Malaysia, where Ismail et al (2012), showed that inadequate milk production was mentioned by the majority of participants to be a concern and makes them stopping breastmilk expression(29).

## 5.2. FEASIBILITY AND TIMING OF BREASTMILK EXPRESSION

### 5.2.1. Time of breast milk expression

Our study showed that 11 participating mothers who were expressing, representing 84.6%, were comfortable to express while at home, especially in the morning before going to work, among them, 4 participating mothers representing 30%, were also expressing themselves at work during the break.

These were different from a study done in Kenya, where Edemba et al, showed that were working mothers who were expressing milk, 77% preferred to express their milk at home, and 3% were expressing at work (19)

## 5.3. STORAGE OF EXPRESSED BREAST MILK

### 5.3.1 Storage method

In our study, participants knew about at least one method of expressed breast milk storage or many methods of expressed breastmilk storage. However, their preference of using one of the others differs from one person to another due to different and personal reasons accordingly.

Some of the mothers preferred breastmilk storage in the refrigerator, for them, storage in the refrigerator is the best method.

However, our study showed an individual preference in the choice of storage methods, where some mothers were using the only method they knew, and for others were storing breastmilk at room temperature rather than in the refrigerator.

Our study results were supported by Edemba et al, wherein their study, breastfeeding mothers who were expressing, preferred storage of breast milk at room temperatures compared to storage in the refrigerator or the freezer(19).

### 5.3.2. Storage time

Results from our study showed that almost all participating mothers did not know about the appropriate storage time of the expressed breast milk according to the method used. Those who were trying to remember the storage time were not sure or were having the wrong information.

Our results were similar to the results from Kenya, where Edemba et al showed a huge knowledge gap in terms of safe storage duration of breast milk when stored in a refrigerator and when stored in the freezer(19).

## 5.4. BARRIERS AND CHALLENGES ENCOUNTERED WHILE EXPRESSING

Our results classified the barriers and challenges in breast milk expression as

- lack of time or not having enough time
- stress with a decrease in breast milk quantity
- workload which sometimes makes it difficult to express while at work
- pain during expression,
- facilities and logistics.

### 5.4.1. Time

Health care breastfeeding mothers who were expressing reported that lack of time and not having enough time for expressing was the main challenge.

These challenges were also found in one study done by Pandey et al (2020), where participating mothers mentioned lack of time was a big challenge during breastmilk expression(17)

### 5.4.2. Stress and decrease in the quantity of breast milk

Our study results showed that a decrease in breast milk quantity was the reason and the challenge for some mothers to stop breastmilk expression shortly after starting expression. This was also associated with stress caused by an increase in responsibilities for working breastfeeding mothers of infants less than 6 months of age.

Our results were supported by Ismail et al (2012), in Malaysia where inadequate breast milk production was reported to be the challenge when mothers started breastmilk expression(29), and also Pandey et al in India showed similar results where mothers reported inadequate breast milk production as a reason for not expressing(17).

#### 5.4.3. Workload associated disturbances

The workload was mentioned to be the reason for early cessation of expressing or not expressing at the workplace, this was reported by expressing health care breastfeeding mothers who reported to feel as a burden to their co-workers when they went for breast milk expression during work time. This was shown by the way co-workers were behaving when they were working with a breastfeeding mother.

Our results were different from a study done by Fatimah et al (2020), where working breastfeeding mothers were supported for expressing while at work and were encouraged(27).

This could be due to the elevated number of patients per one health care provider in our settings, and this can increase the workload when a breastfeeding health care mother leaves for breastmilk expression while at the workplace.

#### 5.4.4. Pain

In our study, the pain was mentioned to be a challenge during breast milk expression. Some of the participating mothers didn't express because they heard that breast milk expression was painful. However, others found that breast milk expression was painful but this could be tolerable.

Our results were supported by Gebrekidan et al (2021), where the participating mothers reported that breast milk expression was painful(28).

#### 5.4.5. Facilities and logistics

Our results showed that lack of appropriate facilities was reported among challenges and barriers of breast milk expression during worktime. The participating mothers reported that the area used for breast milk expression and storage of expressed breast milk, at work was not appropriate, which makes them stop breast milk expression during the daytime.

our results were similar to the results from Malaysia, where Ismail et al (2012), showed that there was no access to a suitable room for breast milk expression at the workplace and that made an expression of breast milk not feasible(29).

Lack of an appropriate breastfeeding room or any other private and well prepared area for breastmilk expression was mentioned by the health care breastfeeding mothers, to be among barriers of breast milk expression at the workplace

#### 5.5. LIMITATION OF THE STUDY

This study enrolled a small number of participants and all of them were recruited from only one hospital

All the participants have the same level of education as they were all working in a tertiary level hospital, their attitudes and experience might be different to other breastfeeding working mothers.

## CHAPTER VI: CONCLUSION AND RECOMMENDATIONS

Breast milk expression is an important practice to help working breastfeeding mothers achieve the goal of exclusive breastfeeding when resuming work after maternity leave ends. Breast milk expression requires tranquility, time, and also support from the family and at the workplace.

Health care providers especially those who are working in maternity and pediatrics are the ones who interact more with mothers and future mothers during their daily activities, they should have enough accurate information to be generated to their clients who are future mothers or mothers.

Our study revealed that health care breastfeeding mothers have some knowledge about breast milk expression with some gaps especially in terms of expressed breastmilk storage but also the level of practice is still not adequate due to different challenges and barriers encountered while expressing especially at the workplace.

Those are our recommendations:

- To the MOH
  - To generate a breastfeeding room policy for the institutions, to facilitate breastfeeding mothers' staff during their daily activities.
  - To initiate a baby-friendly hospital initiative and to support the district hospitals about a baby-friendly hospital initiative policy
- To CHUK
  - ✓ To avail breastfeeding rooms designated for health care providers separated from those of mothers whose babies are admitted to the hospital.
  - ✓ To elaborate a policy facilitating working breastfeeding mothers regarding breast milk expression at the workplace.
  - ✓ To organize some sessions of refreshments about breastmilk expression and storage of expressed breastmilk especially for health care providers working in maternity and pediatrics.
- To the future researchers
  - ✓ To conduct a multicenter study to assess the practice of breast milk expression and storage among health care breastfeeding mothers.
  - ✓ To conduct a thorough assessment of knowledge, practice, and barriers of breast milk expression and storage among working breastfeeding mothers with a mixed study.

## REFERENCES

1. Chandran L, Gelfer P. Breastfeeding: The essential principles. *Pediatr Rev.* 2006;27(11):409–17.
2. Lawrence RM, Lawrence RA. Breastfeeding : *Pediatr Rev.* 32(7).
3. Unicef W. The national feeding situation. In: *The national infant feeding situation.* 2003.
4. Howard, Kimberly, Martin, Anne, Berlin, Lisa, Brooks-Gunn J. Early Mother-Child Separation, Parenting, and Child Well-Being. 2011;13(1):5–26.
5. Saied H, Mohamed A, Suliman A, Anazi W Al. Breastfeeding knowledge, Attitude, and Barriers among Saudi Women in Riyadh. *J Nat Sci Research.* 2013;3(12):6–14.
6. WHO. Infant and young child nutrition: Global strategy on infant and young child feeding. In: *Fifty-Fifth World Health Assembly [Internet].* 2002. p. 1–18. Available from: [http://apps.who.int/gb/archive/pdf\\_files/WHA55/ea5515.pdf](http://apps.who.int/gb/archive/pdf_files/WHA55/ea5515.pdf)
7. Mcfadden A, Kenney-Muir N, Whitford H, Renfrew MJ. Identifying strategies to effectively influence political commitment to breastfeeding: a review of six country case studies. *save the children Breastfeeding: Policy matters.* 2015.
8. WHO. Breastfeeding Policy Brief. In: *Global Nutrition Targets 2025.* 2012.
9. Gupta A, Dadhich JP, Suri S. How Can Global Rates of Exclusive Breastfeeding for the First 6 Months Be Enhanced ? *infant, child Adolesc Nutr.* 2015;5(3):133–40.
10. Waghmare MS. Expressed Breast Milk and Its Storage. *sinhgad e J Nurs.* 2013; III.
11. Jiang B, Hua J, Wang Y, Fu Y, Zhuang Z, Zhu L. Evaluation of the impact of breast milk expression in the early postpartum period on breastfeeding duration : a prospective cohort study. *BMC Pregnancy Childbirth [Internet].* 2015;s12884-015:1–13. Available from: <http://dx.doi.org/10.1186/s12884-015-0698-6>
12. Motee A, Jeewon R. Importance of Exclusive Breastfeeding and Complementary Feeding among Infants Importance of Exclusive Breast Feeding and Complementary Feeding

- Among Infants. *Curr Res Nutr Food Sci*. 2014;2(August 2017).
13. UNICEF. Making the case for improved infant and young child feeding everywhere. In: *From the first hour of life*. 2013. p. 1689–99.
  14. Section UN. A Mother's s Gift, for Every Child. In: *Breastfeeding*. 2018.
  15. Rutagumba AD, Hitayezu J, Kalimba E. Predictors of Exclusive Breastfeeding Practice in Urban Kigali, Rwanda *Med J*. 2021;78(1):38–46.
  16. The lancet. Every mother and child, no matter their location or circumstance, benefits from optimal breastfeeding practices. In: *BREASTFEEDING IN THE 21ST CENTURY*. p. References, [www.thelancet.com/series/breastfeeding](http://www.thelancet.com/series/breastfeeding).
  17. Pandey S. Awareness about expressed breast milk feeding among working mothers visiting a tertiary level hospital, Kathmandu. *J Kathmandu Med Coll*. 2020;8(28, apri-juni 2019).
  18. Judith Labiner-Wolfe, PhDa, Sara B. Fein, PhDa, Katherine R. Shealy, MPH, IBCLC, RLCb, Cunlin Wang, MD P. Prevalence of Breast Milk Expression and. *Suppl Artic*. 2008;122(October 2008).
  19. Edemba P, Irimu G. Knowledge Attitudes and Practice of Breast Milk Expression and Storage Among Working Mothers With Infants Under 6 Months of Age in Public Well Baby Clinics. *Res Sq*. :1–17.
  20. Rai S. Expressed breast milk : a less used option by working mothers of India. *Int J Reprod contraception, Obstet Gynecol*. 2017;6(2017):2867–73.
  21. Prabhu PM. Knowledge, Attitude and Practice of Expression of Breast Milk among Mothers in Western Maharashtra. *J Med Sci Clin Reseach*. 2016;04(January 2016):8828–34.
  22. Okonya JN, Nabimba R, Richard M, Ombeva EA, Nabimba R, Richard M. Perceptions of breast milk expression practices among working mothers. *African J Midwifery an Women's Heal*. 2017;11(4):169–75.
  23. Talbert AW, Tsofa B, Mumbo E, Berkley JA, Mwangome M. Knowledge of , and

- attitudes to giving expressed breastmilk to infants in rural coastal Kenya ; focus group discussions of first time mothers and their advisers. *Int Breastfeed J.* (november 2017):1–7.
24. Guest G, Bunce A, Johnson L. How Many Interviews Are Enough?: An Experiment with Data Saturation and Variability. *Field methods.* 2006;18(1):59–82.
  25. Judith A, Nicki GJ and, Thorogood. *Qualitative Methods for Health Research.* sage. 2017;91–2.
  26. Survey H, Indicators K. No Title. 2019.
  27. Fatimah S, Syed A, Shaw RM. Expressing breastmilk while on break and in private : a qualitative study of Malaysian first-time mothers. *Community Work Fam [Internet].* 2020;0(0):1–16. Available from: <https://doi.org/10.1080/13668803.2020.1787349>
  28. Gebrekidan K, Plummer V, Hall H. Attitudes and experiences of employed women when combining exclusive breastfeeding and work : A qualitative study among office workers in Northern Ethiopia. *Matern Child Nutr.* 2021;(August 2020):1–10.
  29. Ismail TAT, Sulaiman Z, Jalil R, Muda WMW, Man NNN. Breast milk expression among formally employed women in urban and rural Malaysia: A qualitative study. *Int Breastfeed J [Internet].* 2012;7(1):1. Available from: *International Breastfeeding Journal*

APPENDIX 1: BASELINE DEMOGRAPHICS FORM

	Name of the participant		UPI	
	DOB	D/M/Y	Date / time interview	
Current Working Service				
When did her resume work ( post partum)		<input type="checkbox"/> < 1mo <input type="checkbox"/> 1 mo <input type="checkbox"/> 2 mo <input type="checkbox"/> 3mo <input type="checkbox"/> 4 mo <input type="checkbox"/> > 4 mo		
Level of education		<input type="checkbox"/> None <input type="checkbox"/> Primary <input type="checkbox"/> Secondary <input type="checkbox"/> University		
Number of children (Parity )		<input type="checkbox"/> P1 <input type="checkbox"/> P2 <input type="checkbox"/> P3 <input type="checkbox"/> P4 <input type="checkbox"/> > P4		
Time of start of the interview				
Time of end of the interview				

## APPENDIX 2: SEMI-STRUCTURED INTERVIEW SCRIPT / QUESTIONNAIRE

Research objectives:

To determine the practice of breast milk expression in breastfeeding healthcare breastfeeding mothers of infants under 6 months of age as an alternative method to keep their babies on breast milk.

To determine challenges and barriers uncouncted by healthcare breastfeeding mothers regarding breast milk expression and storage of the expressed breast milk

Questions for semi-structured interview (interview guide)

Could you tell me what you know about breast milk expression?

What do you think about breastmilk expression for feeding your infant when you went to work?

What do you know about Rwandan culture and breastmilk expression and the storage of breastmilk?

Have you ever expressed breast milk to feed your infant when you have to go to work?

Please can you tell me a little bit about how to handle and store expressed breast milk? Do you know the duration that you can store expressed breast milk?

Do you know the risks associated with stored expressed breast milk?

What are the main challenges do you meet while expressing breastmilk for feeding your infant?

THANK YOU!

Ibibazo mu Kinyarwanda

Mwambwira muri make icyo mwaba muzi kubijyanye no kwikama amashereka?

Ese mutekereza iki kugikorwa cyo kwikama amashereka agaburirwa umwana mugihe mwagiye mukazi? Ese mwaba muzi icyo umuco nyarwanda uvuga kubijyanye no gukama amashereka agaburirwa umwana ndetse no kuyabika?

Ese waba warigeze akamira umwana amashereka asigara agaburirwa igihe wagiye mukazi?

Mwambwira muri make uburyo muzi bwogufata neza no kubika amashereka mwakamye aribusigare agaburirwa umwana mugihe mwagiye mukazi? Ese muzi igihe amashereka yakamwe abikwa? Ese waba uzi ingorane zishobora guterwa namashereka yakamwe akabikwa?

Mwambwira muri make imbogamizi muhura nazo mugihe muri gukama amashereka musigira umwana mugihe mwagiye mukazi??

MURAKOZE CYANE.

## APPENDIX 1: CONSENT FORM

STUDY NAME: “Practice and barriers of breast milk expression and storage among health care breastfeeding mothers of infants less than 6 months in a referral center in Rwanda”

This Informed Consent Form has two parts:

- Information Sheet (to share information about the research with you)
- Certificate of Consent (for signatures if you agree to take part)

### PART I: Information Sheet

I am Marie Claire UWAMARIYA. We are doing research on Practice and barriers of breast milk expression and storage among health care breastfeeding mothers of infants less than 6 months in a referral center in Rwanda. I am going to give you information and invite you to be part of this research.

The WHO recommends that infants receive only breast milk for their first 6 months of life, with continued breast milk throughout their first year.

To achieve this goal working mothers have to overcome some challenges including separation from their infant while resuming their daily activity after their maternity leave period. Breast milk expression, by hand or with a pump device, may help mothers to achieve some of the goals of successful exclusive breastfeeding and, increase breastfeeding duration.

Expression and storage of breast milk is a strategy that ensures continued breast milk consumption in the event of temporary separation of an infant from the mother especially when the mother resumes the daily activities.

This research will involve an in-person semi-structured recorded interview.

We are inviting health care breastfeeding mothers of infants less than 6 months who are working at CHUK to participate in this study.

Your participation in this research is entirely voluntary. It is your choice whether to participate or not. Whether you choose to participate or not, nothing will change in your continuous daily activities.

If you choose to participate in this study, you will receive no money or other benefits. This study will cause no harm to you. The information you will give will be kept confidential. No one but the researchers will be able to see and hear it, and your identification will be coded.

You do not have to take part in this research if you do not wish to do so. You may also stop participating in this research at any time you choose. It is your choice and all your rights will still be respected.

If you have questions, you may ask them now or later, even after the study has started. If you wish to ask questions later, you may contact any of the following:

Dr Marie Claire UWAMARIYA :

claireuwamariya1986@gmail.com, +250783061470

Dr. Faustine AGABA:faustineagaba@yahoo.fr, +250788438837

Dr Aimable KANYAMUHUNGA: kanyamuhungaa@gmail.com, +250788670200

Dr Florent RUTAGARAMA:rutagaramaflorent@gmail.com+250788595939

This proposal has been reviewed and approved by the IRB of CMHS/UR and the Research Ethics Committee (REC) of CHUK, which are committees whose task is to make sure that research participants are protected from harm. If you wish to find more about the IRB of CMHS/UR, contact “Dr. Stefan JANSEN, sjansen.ur@gmail.com, +250784575900”. For REC of CHUK, you may contact “Dr. RUSINGIZA KAMANZI Emmanuel: erkamanzi@gmail.com, + 250 787553420”.

PART II: Certificate of Consent

I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions that I have asked have been answered to my satisfaction. I consent voluntarily to participate as a participant in this research.

Name of Participant .....

Signature of Participant .....

Statement by the researcher

I have accurately read out the information sheet to the potential participant, and to the best of my ability made sure that the participant understands the aspects of our research.

I confirm that the participant was allowed to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

Name of Researcher .....

Signature of Researcher .....

Date .....

## AMASEZERANO KWEMERA KUJYA MU BUSHAKASHATSI KU BUSHAKE

INYITO Y'UBUSHAKASHATSI: “Practice and barriers of breast milk expression and storage among health care breastfeeding mothers of infants less than 6 months in a referral center in Rwanda”

Aya masezerano afite ibice bibiri:

- Ibisobanuro bihabwa abasabwa kujya mu bushakashatsi
- icyemezo cyo kwemera kujya mu bushakashatsi

### IGICE CYA 1 : Ibisobanuro

Nitwa Marie Claire UWAMARIYA. Turi gukora ubushakashatsi ku bakozi bakora akazi kubuvuzi mubitaro bya CHUK bonsa abana batarengeje amezi atandatu kubijyanye no gukamira abana babo amashereka bagaburirwa igihe bo baje mukazi. Ngiye kubasobanurira hanyuma mbasabe ko mwajya muri ubwo bushakashatsi.

Ikigo gishinzwe ibyubuzima kwisi kitubwiriza ko umwana agomba kugaburirwa amashereka yonyine kuva akivuka gugera agize amezi atandatu hanyuma agakomeza kubona amashereka mu mwaka wambere wubuzima bwe.

Kugira ngo abagore bonsa kandi banakora babigereho bisaba ko barenga imbogamizi zirimo kuba basiga abana babo bakiri bato mugihe bo basubiye mukazi nyuma gato yo kuva mukiruhuko kigenerwa umubyeyi wabyaye. Gukama amashereka ukoresheje intoki cgangwa se akamashini kabugenewe, bifasha abayeyi bonsa kandi banakora gugera kuntego yo kugaburira umwana amashereka yonyine mugihe umwana atararenza amezi atandatu ntakindi kintu bamuvangiye kandi bikongera igihe umubyeyi amara yonsa umwana.

Gukama no kubika amashereka ni uburyo bufasha umubyeyi gukomeza kubasha kugaburira umwana amashereka kabone nubwo umubyeyi we yaba Atari hafi cyanecyane igihe yasubiye mukazi

Turabasa ababyeyi bonsa abana batarengeje amezi atandatu bavutse bakora akazi kubuvuzi mubitaro bya CHUK kujya muri ubu bushakashatsi.

Kujya muri ubu bushakashatsi ni ubushake. Ufite uburenganzira bwo kubujya mo cyangwa kutabujya mo. Wahitamo kubujya mo cyangwa kutabujya mo ntacyo bihindira kumikorere yawe ya buriminsi.

Nuhita mo kujya muri ubu bushakashatsi, nta mafaranga cyangwa ikindi gihembo uzahabwa. Ubu bushakashatsi nta ngaruka buzakugira ho. Amakuru tuzakura mo azagirwa ibanga. Usibye abakora ubu bushakashatsi, nta wundi uzayabona kandi nta bikuranga bizagaragara.

Ntutegetswe kujya muri ubu bushakashatsi niba utabishaka. Ushobora kubuwa mo igihe cyose ubishatse. Ni amahitamo yawe kandi uburenganzira bwawe buzubahirizwa.

Uramutse ufite ibibazo, wabibaza ubu cyangwa nyuma, kabone n'iyi ubushakashatsi bwaba bwaratangiye. Wifuje kubaza ibibazo nyuma wakwitabaza aba bakurikira:

Dr Marie Claire UWAMARIYA:

claireuwamariya1986@gmail.com, +250783061470

Dr. Faustine AGABA:faustineagaba@yahoo.fr, +250788438837

Dr. Aimable KANYAMUHUNGA : kanyamuhungaa@gmail.com, +250788670200

Dr. Florent RUTAGARAMA:rutagaramaflorent@gmail.com+250788595939

Imbanzirizamushinga y'ubu bushakashatsi yaseseguwe ndetse yemezwa na komite ishizwe ubuziranenge bw'ubushakashatsi (IRB) muri Kaminuza y'u Rwanda, Ishuri ry' Ubuvuzi (UR/CMHS) hamwe na komite ishinzwe ubuziranenge bw'ubushakashatsi (REC) mu bitaro bya CHUK. Izi komite ziharanira uburenganzira bw'abemeye kugira uruhare mu bushakashatsi.

Wifuza ibindi bisobanuro kuri IRB ya UR/CMHS wakwitabaza "Dr. Stefan JANSEN, sjansen.ur@gmail.com, +250784575900".

Ku bijyanye na REC ya CHUK yakwitabaza "Dr RUSINGIZA KAMANZI Emmanuel:erkamanzi@gmail.com + 250 787553420"

IGICE CYA 2: Kwemera kujya mu bushakashatsi

Nasomye neza amakuru yatanzwe haruguru, cyangwa se nayasomewe. Nabonye umwanya wo kubaza ibyo ntasobanukiwe kandi ibisobanuro nahawe byanyuze. Nemeye ku bushake kujya muri ubu bushakashatsi.

Amazina y'uwinjiye mu bushakashatsi .....

Amazina .....

Umukono .....

Italiki .....

Ijambo ry'ukora ubushakashatsi

Nasomeye neza kandi nakoze uko nshoboye kose kugira ngo uwinjiye muri ubu bushakashatsi asobanukirwe ibikubiye muri aya masezerano.

Ndemeza ko uwinjiye mu bushakashatsi yahawe umwanya wo kubaza ibibazo kandi ko yabonye ibasonuro by'ukuri mu bushobozi bwanjye. Ndemeza ko uyu agiye kwinjira mu bushakashatsi ku bushake.

Amazina y'ukora ubushakashatsi .....

Umukono .....

Italiki .....

APPENDIX 4: IRB APPROVAL



UNIVERSITY of  
RWANDA

COLLEGE OF MEDICINE AND HEALTH SCIENCES  
DIRECTORATE OF RESEARCH & INNOVATION

**CMHS INSTITUTIONAL REVIEW BOARD (IRB)**

Kigali, 22<sup>nd</sup> /June /2021

Dr. UWAMARIYA Marie Claire

School of Medicine and Pharmacy, CMHS, UR

**Approval Notice: No 217/CMHS IRB/2021**

Your Project Title *“Practice and Barriers of Breast Milk Expression and Storage among Health Care Breastfeeding Mothers of Infants Less Than 6 Months in a Referral Center in Rwanda”* has been evaluated by CMHS Institutional Review Board.

Name of Members	Institute	Involved in the decision		
		Yes	No (Reason)	
			Absent	Withdrawn from the proceeding
Prof Kato J. Njunwa	UR-CMHS	X		
Dr Stefan Jansen	UR-CMHS	X		
Dr Brenda Asiimwe-Kateera	UR-CMHS	X		
Prof Ntaganira Joseph	UR-CMHS	X		
Dr Tumusiime K. David	UR-CMHS	X		
Dr Kayonga N. Egide	UR-CMHS	X		
Mr Kanyoni Maurice	UR-CMHS		X	
Prof Munyanshongore Cyprien	UR-CMHS	X		
Mrs Ruzindana Landrine	Kicukiro district		X	
Dr Gishoma Darius	UR-CMHS	X		
Dr Donatilla Mukamana	UR-CMHS	X		
Prof Kyamanywa Patrick	UR-CMHS		X	
Prof Condo Umutesi Jeannine	UR-CMHS		X	
Dr Nyirazinyoye Laetitia	UR-CMHS	X		
Dr Nkeramihigo Emmanuel	UR-CMHS		X	
Sr Maliboli Marie Josee	CHUK	X		
Dr Mudenge Charles	Centre Psycho-Social	X		

After reviewing your protocol during the IRB meeting of where quorum was met and revisions made on the advice of the CMHS IRB submitted on 18<sup>th</sup> June 2021, **Approval has been granted to your study.**

Email: [researchcenter@ur.ac.rw](mailto:researchcenter@ur.ac.rw)

P.O Box 3286 Kigali, Rwanda

[www.ur.ac.rw](http://www.ur.ac.rw)

Please note that approval of the protocol and consent form is valid for **12 months**.

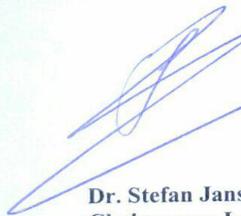
You are responsible for fulfilling the following requirements:

1. Changes, amendments, and addenda to the protocol or consent form must be submitted to the committee for review and approval, prior to activation of the changes.
2. Only approved consent forms are to be used in the enrolment of participants.
3. All consent forms signed by subjects should be retained on file. The IRB may conduct audits of all study records, and consent documentation may be part of such audits.
4. A continuing review application must be submitted to the IRB in a timely fashion and before expiry of this approval
5. Failure to submit a continuing review application will result in termination of the study
6. Notify the IRB committee once the study is finished

Sincerely,

Date of Approval: The 22<sup>nd</sup> June 2021

Expiration date: The 22<sup>nd</sup> June 2022



**Dr. Stefan Jansen**  
Chairperson Institutional Review Board,  
College of Medicine and Health Sciences, UR

Cc:

- Principal College of Medicine and Health Sciences, UR
- University Director of Research and Postgraduate Studies, UR

## APPENDIX 5: CHUK ETHICS COMMITTEE APPROVAL

  
Quality Health Care  
Training & Research

**CENTRE HOSPITALIER UNIVERSITAIRE  
UNIVERSITY TEACHING HOSPITAL**

**Ethics Committee / Comité d'éthique**

5<sup>th</sup> Jul, 2021

Ref.: EC/CHUK/076/2021

**Review Approval Notice**

Dear UWAMARIYA Marie Claire,

Your research project: **"PRACTICE AND BARRIERS OF BREAST MILK EXPRESSION AND STORAGE AMONG HEALTH CARE BREASTFEEDING MOTHERS OF INFANTS LESS THAN 6 MONTHS IN A REFERRAL CENTER IN RWANDA "**

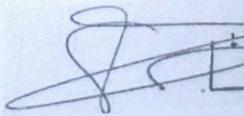
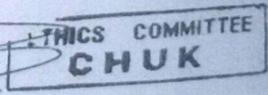
During the meeting of the Ethics Committee of University Teaching Hospital of Kigali (CHUK) that was held on 5<sup>th</sup> Jul, 2021 to evaluate your request for ethical approval of the above mentioned research project, we are pleased to inform you that the Ethics Committee/CHUK has approved your research project.

You are required to present the results of your study to CHUK Ethics Committee before publication by using this link: [www.chuk.rw/research/fullreport/?appid=405&&chuk](http://www.chuk.rw/research/fullreport/?appid=405&&chuk).

PS: Please note that the present approval is valid for 12 months.

Yours sincerely,

**Dr Emmanuel Rusingiza Kamanzi**  
The Chairperson, Ethics Committee,  
University Teaching Hospital of Kigali



Scan code to verify.

*" University teaching hospital of Kigali Ethics committee operates according to standard operating procedures (Sops) which are updated on an annual basis and in compliance with GCP and Ethics guidelines and regulations "*

Web Site : [www.chuk.rw](http://www.chuk.rw) ; B.P. 655 Kigali- RWANDA Tél.: 00 (250) 252575462. E-Mail: [chuk.hospital@chuk.rw](mailto:chuk.hospital@chuk.rw)

